

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for reducing the resolution of media data, said method comprising:

accessing receiving compressed input data for a frame of a plurality of frames, wherein said frame is at a first resolution and comprises a plurality of macroblocks, wherein said plurality of macroblocks comprises a subset of macroblocks that is to be encoded as a single output macroblock;

selecting a data processing function according to the number of said macroblocks in said subset that are characterized as intra-coded $[[,]]$ wherein a macroblock is characterized as intra-coded if the content of said macroblock is independent of the content of another macroblock; and

if provided less than all of said macroblocks in said subset are characterized as intra-coded and if said number of macroblocks in said subset characterized as intra-coded satisfies a threshold, downsampling said subset of macroblocks compressed input data to generate said output macroblock comprising compressed downsampled data at a second resolution that is reduced relative to said first resolution. $[[,]]$ said compressed downsampled data used to generate a frame at said second resolution; and

decoding said compressed downsampled data to generate decompressed downsampled data at said second resolution.

2. (Original) The method as recited in Claim 1 wherein said input data comprise motion vectors, wherein said method comprises:

generating motion vectors for said frame at said second resolution using said motion vectors from said input data.

3. (Original) The method as recited in Claim 2 wherein said motion vectors for said frame at said second resolution are generated by averaging said motion vectors from said input data.

4. (Original) The method as recited in Claim 1 wherein said input data are compressed according to a discrete cosine transform-based compression scheme, wherein said input data comprise discrete cosine transform (DCT) coefficients.

5. (Original) The method as recited in Claim 4 comprising:
generating an output data stream comprising said frame at said second resolution; and
determining a bit rate for said output data stream using said DCT coefficients from said input data.

6. (Original) The method as recited in Claim 5 wherein said input data are encoded according to a first compression scheme and said output data stream are encoded according to a second compression scheme.

7. (Previously Presented) The method as recited in Claim 1 wherein said media data are selected from the group consisting of: video data, audio data, image data, graphic data, and web page data.

8. (Currently Amended) A method for reducing the resolution of media data, said method comprising:

accessing receiving input data comprising comprised of compressed data for a plurality of macroblocks, wherein said plurality of macroblocks comprises a subset of macroblocks that is to be encoded as a single output macroblock and wherein a macroblock is characterized as a first coding type if said macroblock is dependent on a macroblock from a reference frame and is otherwise characterized as a second coding type;

selecting data processing functions according to the number of macroblocks in said subset that are characterized as said first coding type and also according to the number of macroblocks in said subset that are characterized as said second coding type, wherein at least one of said processing functions comprises downsampling compressed data in the discrete cosine transform (DCT) domain; and

generating said an output macroblock from said plurality of macroblocks using said data processing functions, said output macroblock providing a reduced resolution relative to said input data.

9. (Original) The method as recited in Claim 8 comprising:

determining a coding type for said output macroblock according to the number of macroblocks characterized as said first coding type and the number of macroblocks characterized as said second coding type; and

selecting said data processing functions according to said coding type of said output macroblock.

10. (Currently Amended) The method as recited in Claim 9 wherein, if provided said output macroblock is characterized as said first coding type, said data processing functions comprise comprising:

constructing a predicted macroblock for each macroblock in said subset ~~plurality~~ of macroblocks by applying motion compensation to a respective macroblock in a reference frame, wherein said constructing comprises a decoding function such that said predicted macroblocks comprise decompressed data;

downsampling predicted macroblocks to generate a downsampled macroblock; and

encoding said downsampled macroblock to generate said output macroblock.

11. (Currently Amended) The method as recited in Claim 8 wherein, ~~if provided~~ all of said plurality of macroblocks are characterized as said second coding type, said data processing functions comprise:

downsampling said subset of macroblocks ~~input data~~ to generate said output macroblock comprising compressed downsampled data.

12. (Original) The method as recited in Claim 11 comprising:
decoding said compressed downsampled data to generate decompressed downsampled data; and
upsampling said decompressed downsampled data.

13. (Canceled).

14. (Currently Amended) The method as recited in Claim 8 wherein, ~~if provided~~ the number of macroblocks in said subset characterized as said second coding type ~~satisfies~~ ~~satisfy~~ a first threshold, said data processing functions comprise:

constructing a predicted macroblock for each macroblock in said subset of macroblocks characterized as said first coding type by applying motion compensation to a respective macroblock in a reference frame, wherein said constructing comprises a decoding function such that a predicted macroblock comprises decompressed data;

encoding each predicted macroblock; and

downsampling predicted macroblocks and said macroblocks characterized as said second coding type to generate said output macroblock comprising compressed downsampled data.

15. (Original) The method as recited in Claim 14 comprising:
decoding said compressed downsampled data to generate
decompressed downsampled data; and
upsampling said decompressed downsampled data.

16. (Original) The method as recited in Claim 8 wherein said input
data comprise motion vectors, said method comprising:
generating a motion vector for said output macroblock by averaging said
motion vectors.

17. (Original) The method as recited in Claim 8 wherein said input
data are compressed according to a discrete cosine transform-based
compression scheme.

18. (Original) The method as recited in Claim 17 comprising:
generating a quantization parameter for said output macroblock using
quantization parameters for said plurality of macroblocks.

19. (Currently Amended) A system for reducing the resolution of
media data, said system comprising:
an input buffer adapted to receive compressed input data at a first
resolution, said compressed input data comprising data for a plurality of
macroblocks, wherein said plurality of macroblocks comprises a subset of
macroblocks that is to be encoded as a single output macroblock and wherein
a macroblock is characterized as a first coding type if said macroblock is
dependent on a macroblock from another frame and is otherwise characterized
as a second coding type;

a mode selector coupled to said input buffer, said mode selector
adapted to select a data processing function according to the number of

macroblocks in said subset that are characterized as said first coding type and the number of macroblocks in said subset that characterized as said second coding type;

a downsampler coupled to said mode selector, said downsampler adapted to downsample said compressed input data and generate compressed downsampled data at a second resolution that is reduced relative to said first resolution; and

a decoder coupled to said mode selector, said decoder adapted to decode said compressed input data and generate decompressed data, wherein said subset of macroblocks compressed input data is directed by said mode selector to said downsampler if provided less than all of said macroblocks in said subset are characterized as intra-coded and if said number of macroblocks characterized as intra-coded exceeds a threshold, wherein and otherwise said subset of macroblocks compressed input data is directed by said mode selector to said decoder.

20. (Canceled).

21. (Original) The system of Claim 19 comprising:

a motion vector generator coupled to said input buffer, said motion compensator adapted to generate motion vectors for a frame at said second resolution using motion vectors from said input data.

22. (Original) The system of Claim 19 comprising:

a rate controller coupled to said input buffer, said rate controller adapted to determine a quantization step size for a frame at said second resolution according to quantization parameters from said input data.

23. (Original) The system of Claim 19 wherein said input data are compressed according to a discrete cosine transform-based compression scheme, wherein said input data comprise discrete cosine transform (DCT) coefficients.

24. (Previously Presented) The system of Claim 19 wherein said media data are selected from the group consisting of: video data, audio data, image data, graphic data, and web page data.

25. (Currently Amended) A computer-usable medium having computer-readable program code embodied therein for causing a computer system to perform a method comprising:

accessing compressed input data residing in a buffer, said compressed input data comprising compressed data for a frame of a plurality of frames, wherein said frame is at a first resolution and comprises a plurality of macroblocks, wherein said plurality of macroblocks comprises a subset of macroblocks that is to be encoded as a single output macroblock;

selecting a data processing function according to the number of said macroblocks in said subset that are characterized as intra-coded ~~[[.]]~~ wherein a macroblock is characterized as intra-coded if the content of said macroblock is independent of the content of another macroblock;

~~if provided~~ less than all of said macroblocks in said subset are characterized as intra-coded and ~~if~~ said number of macroblocks in said subset characterized as intra-coded satisfies a threshold, generating compressed downsampled data by downsampling said subset of macroblocks ~~compressed input data~~, said compressed downsampled data at a second resolution that is reduced relative to said first resolution, said compressed downsampled data used to generate said output macroblock ~~a frame at said second resolution;~~

~~decoding said compressed downsampled data to generate~~ generating decompressed downsampled data at said second resolution ~~by decoding said compressed downsampled data~~; and

~~upsampling said decompressed downsampled data to generate~~ generating decompressed data at a resolution corresponding to said first resolution ~~by upsampling said decompressed downsampled data~~, said decoding and said upsampling performed only if provided said decompressed data are needed as a reference for another frame.

26. (Original) The computer-usable medium of Claim 25 wherein said computer-readable program code embodied therein causes a computer system to perform a method comprising:

accessing motion vectors for said frame at said first resolution; and
deriving motion vectors for said frame at said second resolution from said motion vectors for said frame at said first resolution.

27. (Original) The computer-usable medium of Claim 26 wherein said motion vectors for said frame at said second resolution are generated by averaging said motion vectors for said frame at said first resolution.

28. (Original) The computer-usable medium of Claim 25 wherein said input data are compressed according to a discrete cosine transform-based compression scheme, wherein said input data comprise discrete cosine transform (DCT) coefficients.

29. (Original) The computer-usable medium of Claim 25 wherein said computer-readable program code embodied therein causes a computer system to perform a method comprising:

accessing quantization parameters for said frame at said first resolution;

and

deriving quantization parameters for said frame at said second resolution from said quantization parameters for said frame at said first resolution.